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EXAMINER	
CALANDRA, ANTHONY J	
ART UNIT	PAPER NUMBER
1791	

NOTIFICATION DATE	DELIVERY MODE
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

uspatents@senniger.com

Office Action Summary	Application No.	Applicant(s)	
	10/564,881	JAWAID, ABRAR	
	Examiner	Art Unit	
	ANTHONY J. CALANDRA	1791	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *18 June 2008*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *23-43* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *23-43* is/are rejected.

7)☒ Claim(s) *43* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

Detailed Office Action

1. The communication dated 6/18/2008 has been entered and fully considered.

2. Claims 23-43 are currently pending.

Claim Objections

3. Claim 43 objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim, or amend the claim to place the claim in proper dependent form, or rewrite the claim in independent form. Applicant states that the lignocellulosic element comprises lignocellulose. Examiner fails to see why a person of ordinary skill in the art would interpret the lignocellulosic element of independent claim 42 as not comprising lignocellulose. Therefore the claim fails to further limit the parent claim.

Response to Arguments

4. Applicant's arguments filed 6/18/2008 have been fully considered but they are not persuasive.

Examiner has relied upon Chemical Pulping by GULLICHSEN, hereinafter GULLICHSEN, solely as evidence in the below arguments.

Examiner has relied upon Handbook for Pulp and Paper Technologists by SMOOK, hereinafter SMOOK, solely as evidence in the below arguments.

- Applicant argues that AKHTAR teaches pulping and that pulping breaks down wood into two separate components cellulosic fiber and lignin while the invention is directed to the recovery of lignocellulosic.

Applicant points to paragraph 3 of the AKHTAR specification which states that lignin is the least desirable. Applicant evaluates this statement to mean that the pulping process of AKHTAR removes the lignin from the cellulose. Applicant error in the argument is in assuming that a pulping process fully removes lignin from cellulose. This is incorrect assumption. Even a kraft chemical pulping process only partially removes lignin from lignocellulose as evidenced by GULLICHSEN [pg A28 Table 3, pulped wood still contains lignin and therefore still is a lignocellulose]. In this case the process of AKHTAR is *not even a chemical process*. AKHTAR discloses treating logs with microwaves and then *mechanically pulping* the chips [paragraph 0003 claim 2, pg. 72]. Mechanical pulping separates fibers from each other but mostly maintains lignin in said fibers resulting in a higher yield [SMOOK Chapter 4].

Therefore, since AKHTAR teaches *mechanical pulping*, and mechanical pulping retains *lignin* on the fiber, AKHTAR does disclose a method for recovering a lignocellulosic element.

Further, in response to applicant's arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208

USPQ 871 (CCPA 1981); *In re Merck & Co.,* 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986).

Examiner has cited AKHTAR to show that microwave radiation increases porosity and permeability of fibers and therefore a person of ordinary skill in the art would expect the fibers of MICHANICKL to increase. MICHANICKL states that separation of the fibers requires impregnation and discloses methods for increasing the speed of said impregnation. Applicant fails to argue why a person of ordinary skill in the art would not expect the lignocellulosic fiber material of MICHANICKL to have increased porosity and therefore increase impregnation under the microwave treatment of AKHTAR.

- Applicant argues that it would ***not*** be *prima facie* obvious to combine AKHTAR and MICHANICKL.

However, the applicant does not comment why no *prima facie* case has been established. Examiner has given clear motivation to combine the two references *"A person of ordinary skill in the art would have been motivated to do so since microwave radiation increases the porosity and permeability of fibers by breaking pit membranes and vessel ends [see e.g. AKHTAR paragraph 0038]. This increase in permeability leads lower chemical uses [see e.g. AKHTAR paragraph 0038]. Similarly, the fibers and chips in the board material would also increase in permeability and porosity allowing higher impregnation and impregnation rate as desired by MICHANICKL et al."*

Further both references are related to the subject matter of separating bonded lignocellulosic materials.

- Applicant argues that the board material is *adhesively bonded* is a key requirement. The feedstock of AKHTAR is wood while the feedstock of the instant claims adhesively bonded lignocellulosic components. Applicant seems to suggest that AKHTAR and BERGSTROM are not 'adhesively bonded'.

In reading of the claims the examiner must give the broadest reasonable interpretation of the claims. Lignin is known as the glue that holds fibers together [GULLICHSEN pg. A21 paragraph 1 and pg. A26]. 'Glue' is a substance that adhesively binds substances together. Further claim 23, 41, and 42, of the instant application only states 'board material'. A board material could be read as softwood two-by-four board which has lignocellulosic elements bond together by adhesive lignin which would certainly be expected to be broken down as described by MICHANICKL/AKHTAR.

- Applicant argues that BERGSTROM teaches pulping and that pulping breaks down wood into two separate components cellulosic fiber and lignin while the invention is directed to the recovery of lignocellulosic.

As per the argument of AKHTAR, the applicant makes an error in the argument in assuming that a pulping process fully removes lignin from cellulose. This is incorrect assumption. Even a kraft chemical pulping process only partially removes lignin from lignocellulose as evidenced by GULLICHSEN [pg A28 Table 3, pulped wood still contains lignin and therefore still is a lignocellulose]. In this case the process of BERGSTROM is *not even a chemical process*. BERGSTROM discloses treating wood

with microwaves/radio waves to split the fibers. It does not disclose separating the lignin from the fibers during experimentation [column 5 lines 1-22]. Therefore the lignin is maintained with the fibers of BERSTROM and as such BERGSTROM teaches a method for separating bound fibers from each other and said fibers are lignocellulosic fibers.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

6. The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

7. Claims 23, 24, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 41, 42 and 43 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent 5,804,035 MICHANICKL et al., hereinafter MICHANICKL et al. in view of WIPO publication WO 03/040462 AKHTAR et al., hereinafter AKHTAR et al.

As for claim 23, MICHANICKL et al. discloses a method where a board material that is composed of adhesively bonded components has a constituent of it recovered (*A method of*

recovering a constituent of a board material comprised of a matrix of adhesively bonded lignocellulosic elements [see e.g. abstract]). MICHANICKL et al. discloses soaking (swelling) the material in impregnation liquor (*swelling the material by subjecting the material to a soaking or immersion in a liquid medium* [see e.g. Figure 1 and column 6 lines 25-30]). MICHANICKL et al. teaches that the recovered chips and fibers can be recovered and reused to make new fiberboard (*recovering the constituent* [see e.g. column 7 lines 30-35]).

MICHANICKL et al. further discloses that full disintegration requires an impregnation of at least 80% treatment chemical and that the impregnation speed can be increased by vacuum treatment, pressure treatment, or heating the impregnation solution [see e.g. column 5 lines 8-17]. MICHANICKL et al. however does not disclose using electromagnetic radiation to help with disintegration or increase the impregnation rate. AKHTAR et al. teaches a process for treating wood logs which are going to be pulped mechanically or chemi-mechanically [see e.g. abstract and paragraph 0040]. In AKHTAR, the logs are first exposed to a electromagnetic radiation, microwaves, at 915 MHz, (*electromagnetic radiation and wherein the electromagnetic radiation has a frequency in the range of from 896 + 20 MHz to 2450 + 25 MHz or a frequency in the range of from 100 kHz to 100 MHz* [see e.g. paragraph 0054 and 0055]) and then treated in a further pulping process. At the time of the invention it would have been obvious to pre-treat the board material of MICHANICKL et al. with the microwave radiation of AKHTAR et al. A person of ordinary skill in the art would have been motivated to do so since microwave radiation increases the porosity and permeability of fibers by breaking pit membranes and vessel ends [see e.g. AKHTAR paragraph 0038]. This increase in permeability leads lower chemical uses [see e.g. AKHTAR paragraph 0038]. Similarly, the fibers and chips in the board material would also

increase in permeability and porosity allowing higher impregnation and impregnation rate as desired by MICHANICKL et al.

As for claim 24, AKHTAR et al. teaches the use of microwave radiation and uses a generator that generates 915 MHz microwave radiation which falls within the instant claimed range [see e.g. paragraph 0054].

As for claim 27, AKHTAR et al. discloses multiple power ranges for the microwave radiation treatment including 10 kW and 20 kW which fall within the instant claimed ranges [see e.g. Figure 7].

As for claim 28 and 29, MICHANICKL et al. discloses that the impregnating solution consists of water, urea, and lye [see e.g. column 7 lines 1-5 and column 6 lines 25-30]. Water is a polar solvent.

As for claim 30, AKHTAR et al. discloses that the microwave pretreatment occurs before impregnation as this allows for increased porosity for chemical treatment before refining [see e.g. paragraphs 0038- 0040].

As for claim 31 and 32, MICHANICKL et al. discloses that the impregnation treatment takes place at the elevated temperature of 80-120 degrees Celsius, which overlaps with the instant claimed range [see e.g. column 3 lines 1-6].

As for claim 33, AKHTAR et al. discloses that the electromagnetic microwave pretreatment occurs before impregnation [see e.g. paragraphs 0038- 0040] and does not disclose having the microwave pretreatment and impregnation occur simultaneously. MICHANICKL et al. discloses that the impregnation can be sped up by heating of the impregnation solution. Examiner notes that microwaving will in addition to opening the pores of the fibers, would also

additionally heat the impregnation solution. Therefore, it would be *prima facie* obvious to submerse and expose the board material to microwave radiation simultaneously.

As for claim 34, AKHTAR et al. discloses that impregnation vessel contains a stirring device [see e.g. column 9 line 21]. Examiner has interpreted the stirring device as a mechanical agitator which breaks the fiber board into a solution of chips, fibers, veneer, and other undesired components [see e.g. column 9 lines 45-48].

As for claim 35 and 36, AKHTAR et al. disclose that the chips and fibers are removed and transferred to a reprocessing plant. Chips and fines are lignocelluloses. Further AKHTAR et al. disclose that the recovered chips and fibers can be reprocessed into chip board or fiber board, both processes of which require drying [see e.g. column 7 lines 30-35].

As for claims 37 and 38, AKHTAR et al. discloses that the process may be used on medium density fiber boards [see e.g. column 5 lines 44-47].

As for claim 39, AKHTAR et al. discloses that the electromagnetic radiation used is microwave radiation [see e.g. abstract].

As for claim 41, MICHANICKL et al. discloses a method where a board material that is composed of adhesively bonded components has a constituent of it recovered (*A method of recovering a constituent of a board material comprised of a matrix of adhesively bonded lignocellulosic elements* [see e.g. abstract]). MICHANICKL et al. discloses soaking (swelling) the material in impregnation liquor at the overlapping temperature of 80 to 120 degrees C (*swelling the material by subjecting the material to a soaking or immersion in a liquid medium at a temperature of 60 C to 90 C* [see e.g. Figure 1 and column 6 lines 25-30 and column 3 lines 3-6]). MICHANICKL et al. discloses that impregnation vessel contains a stirring device.

Examiner has interpreted the stirring device as a mechanical agitator which breaks the fiber board into a solution of chips, fibers, veneer, and other undesired components (*mechanically agitating the board material in the liquid medium to produce a fibrous suspension* [see e.g. column 9 lines 45-48]). MICHANICKL et al. teaches that the recovered chips and fibers can be recovered and reused to make new fiberboard (*recovering the lignocellulose constituent from the fibrous suspension* [see e.g. column 7 lines 30-35]).

MICHANICKL et al. further discloses that full disintegration requires an impregnation of at least 80% treatment chemical and that the impregnation speed can be increased by vacuum treatment, pressure treatment, or heating the impregnation solution [see e.g. column 5 lines 8-17]. MICHANICKL et al. however does not disclose using electromagnetic radiation to help with disintegration or increase the impregnation rate. AKHTAR et al. teaches a process for treating wood logs which are going to be pulped mechanically or chemi-mechanically [see e.g. abstract and paragraph 0040]. In AKHTAR, the logs are first exposed to a electromagnetic radiation, microwaves, at 915 MHz, at powers of 10 and 20 kW (*electromagnetic radiation and wherein the electromagnetic radiation has a frequency in the range of from 10 MHz to 2500 MHz and a power level from 500 W to 30 kW* [see e.g. paragraph 0054-0055 and Figure 7]) and then treated in a further pulping process. At the time of the invention it would have been obvious to pre-treat the board material of MICHANICKL et al. with the microwave radiation of AKHTAR et al. A person of ordinary skill in the art would have been motivated to do so since microwave radiation increases the porosity and permeability of fibers by breaking pit membranes and vessel ends [see e.g. AKHTAR paragraph 0038]. This increase in permeability leads lower chemical uses [see e.g. AKHTAR paragraph 0038]. Similarly, the fibers and chips in the board

material would also increase in permeability and porosity allowing higher impregnation and impregnation rate as desired by MICHANICKL et al.

As for claim 42 and 43, MICHANICKL et al. discloses a method where a board material that is composed of adhesively bonded components has a constituent of it recovered (*A method of recovering a constituent of a board material comprised of a matrix of adhesively bonded lignocellulosic elements* [see e.g. abstract]). MICHANICKL et al. discloses soaking (swelling) the material in impregnation liquor at the overlapping temperature of 80 to 120 degrees C for 5 to 15 minutes (*swelling the material by subjecting the material to a soaking or immersion in a liquid medium at a temperature of 60 C to 90 C for between 10 and 25 minutes* [see e.g. Figure 1 and column 6 lines 25-30; column 3 lines 3-6; column 7 lines 1-5]). MICHANICKL et al. discloses that impregnation vessel contains a stirring device. Examiner has interpreted the stirring device as a mechanical agitator which breaks the fiber board into a solution of chips, fibers, veneer, and other undesired components (*mechanically agitating the board material in the liquid medium to produce a fibrous suspension* [see e.g. column 9 lines 45-48]). MICHANICKL et al. teaches that the recovered chips and fibers can be recovered and reused to make new fiberboard (*recovering the lignocellulose constituent from the fibrous suspension* [see e.g. column 7 lines 30-35]).

MICHANICKL et al. further discloses that full disintegration requires an impregnation of at least 80% treatment chemical and that the impregnation speed can be increased by vacuum treatment, pressure treatment, or heating the impregnation solution [see e.g. column 5 lines 8-17]. MICHANICKL et al. however does not disclose using electromagnetic radiation to help with disintegration or increase the impregnation rate. AKHTAR et al. teaches a process for

treating wood logs which are going to be pulped mechanically or chemi-mechanically [see e.g. abstract and paragraph 0040]. In AKHTAR, the logs are first exposed to a electromagnetic radiation, microwaves, at 915 MHz, at powers of 10 and 20 kW (*electromagnetic radiation and wherein the electromagnetic radiation has a frequency in the range of from 10 MHz to 2500 MHz and a power level from 500 W to 30 kW* [see e.g. paragraph 0054-0055 and Figure 7]) and then treated in a further pulping process.

AKHTAR discloses that the microwave radiation treatment can last from a 90 seconds to 6 minutes and does not disclose the instant claimed range of 30 to 90 seconds [see e.g. Figure 7]. However, at the time of the invention it would have been obvious to a person of ordinary skill in the art to optimize the amount of time that the board material was exposed microwaves to depending on the total mass of the board, moisture content, board temperature, and how easily the board is breaking up in further treatments in order to adjust the total energy exposure [see e.g. MPEP 2144.05 II B]. The time of the microwaving is a result effective variable which determines how much heat is absorbed by the board.

At the time of the invention it would have been obvious to pre-treat the board material of MICHANICKL et al. with the microwave radiation of AKHTAR et al. A person of ordinary skill in the art would have been motivated to do so since microwave radiation increases the porosity and permeability of fibers by breaking pit membranes and vessel ends [see e.g. AKHTAR paragraph 0038]. . This increase in permeability leads lower chemical uses [see e.g. AKHTAR paragraph 0038]. Similarly, the fibers and chips in the board material would also increase in permeability and porosity allowing higher impregnation and impregnation rate as desired by MICHANICKL et al. Neither, MICHANICKL et al. nor AKHTAR gives any direct

guidance to the time between microwave treatment and impregnation. However, a short time between microwaving and soaking would be expected as there are no disclosed intervening steps between the microwave and impregnation step. Further, MICHANICKL discloses that heating is important [see e.g. column 5 lines 10-17] and letting the board sit after microwaving would waste heat. Therefore sending the microwave treated board within 5 to 15 seconds to the immersion bath would have been obvious to a person of ordinary skill in the art.

8. Claims 25, 26 and 40 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent 5,804,035 MICHANICKL et al., hereinafter MICHANICKL et al. in view of WIPO publication WO 03/040462 AKHTAR et al., hereinafter AKHTAR et al. as applied to claims 23, 24, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 41, and 42 above, and further in view of U.S. Patent 4,000,032 BERSTROM et al, hereinafter BERSTROM et al.

As for claim 25, AKHTAR disclose that microwave radiation can be used as a pre-treatment for lignocellulosic fibers. AKHTAR only discloses the single frequency of 915 MHz [see e.g. paragraph 0054] and does not disclose the frequency of 2450 MHz. BERGSTROM et al. discloses the specific frequency of 2450 MHz [see e.g. column 5 line 52]. At the time of the invention it would have been obvious to a person of ordinary skill in the art to substitute the 2450 MHz wave of BERGSTROM et al. for the 915 MHz wave of MICHANICKL et al. and AKHTAR et al. A person of ordinary skill in the art would reasonably expect that both frequency waves to heat up the board material and open up the pores of the fibers to allow greater impregnation. Examiner further notes as stated in the specification that 915 and 2450 MHz are both the reserved frequencies for industrial/domestic use [see e.g. pg. 5] and it would have been obvious to try one of a finite number of available industrial microwave types.

As for claim 26 and 40, neither MICHANICKL et al. nor AKHTAR et al. disclose using radio waves to pre-treat lignocellulosic materials before impregnation. BERGSTROM et al. discloses that a wide range of frequencies can be used to irradiate lignocellulosic materials from 10 MHz to 300,000 MHz [see e.g. column 3 lines 53-55]. At the time of the invention it would have been obvious to a person of ordinary skill in the art to substitute radio waves of BERGSTROM et al. for the microwave pretreatment of MICHANICKL et al. and AKHTAR et al. A person of ordinary skill in the art would reasonably expect that both radio waves would heat up and increase the permeability of the board materials of MICHANICKL et al. in similar fashion as the microwaves of AKHTAR et al.

Conclusion

9. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to ANTHONY J. CALANDRA whose telephone number is (571) 270-5124. The examiner can normally be reached on Monday through Thursday, 7:30 AM-5:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Steven Griffin can be reached on (571) 272-1189. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

AJC

/Eric Hug/
Primary Examiner, Art Unit 1791